

Natural Resource Management and Policy

David Zilberman · Renan Goetz · Alberto Garrido
Series Editors

Alberto Garrido
M. Ramón Llamas
Consuelo Varela-Ortega
Paula Novo
Roberto Rodríguez-Casado
Maite M. Aldaya

Water Footprint and Virtual Water Trade in Spain

Policy Implications

 Fundación
Marcelino Botín

 Springer

04.01.10 23:53

Presentation of the Book

SIDE EVENT: 9.Sept. 2010: 12:45-13:45
Water Intelligence: Rethinking Water and
Food Security

Alberto Garrido and Maite M. Aldaya

Water Observatory – Marcelino Botin Foundation
CEIGRAM – Technical University of Madrid



OBSERVATORIO DEL AGUA
WATER OBSERVATORY



Goals of the Book

- Analyze Spain's virtual water 'trade' and water footprint
- green and blue (surface and groundwater) components
- from a hydrological and economic perspective

Main contributions to the literature on WF and VW

- By evaluating both WF and VW over time and at the provincial scale
- By separating green and blue water components
- By assessing WF in terms of $\text{m}^3/\text{€}$ — bringing the pioneering approach of WF based on m^3/Tn to a socio-economic context
- Water scarcity is evaluated in terms of opportunity cost, both for VWT and WF, corrected with the water quality status of the rivers in each province.

Inference potential:

- Time variation (policy, technology change, trade)
- Spatial variation (climatic, water conditions)

Virtual water trade:

- Exports
- Imports

Policy implications:

- Trade
- Water Policy
- Sustainability

Blue water

Green water

Water footprint in Spain

Global Sustainability

External

Internal

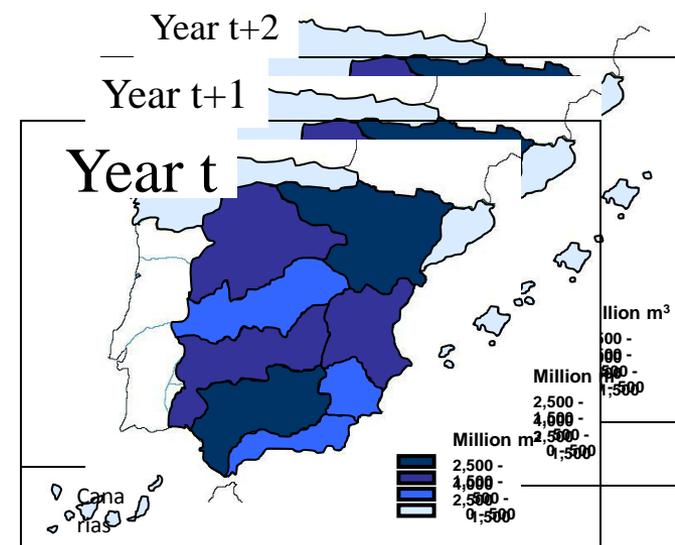
Double perspective of the WF evaluation

Economic

- Water scarcity (€/m³)
- Water footprint:
 - € m³/ € kg
 - € m³/ € kg

Quantitative:

- Water scarcity:
 - m³/kg
 - m³/€ kg

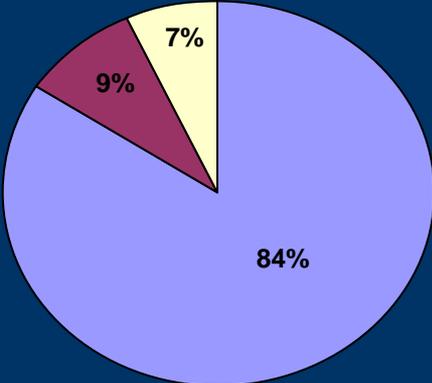


Main findings

- Virtual water trade mitigates drought cycles (acts as a counter-cyclical effect). Green water and global market connections
- Virtual water trade is mainly a consequence of agricultural (crop and livestock) policies:
 - boosts water and land productivity
 - favours specialisation and efficiency
 - permits more efficient use of available green water
- Enables a closer connection of water uses in the basin with global water use

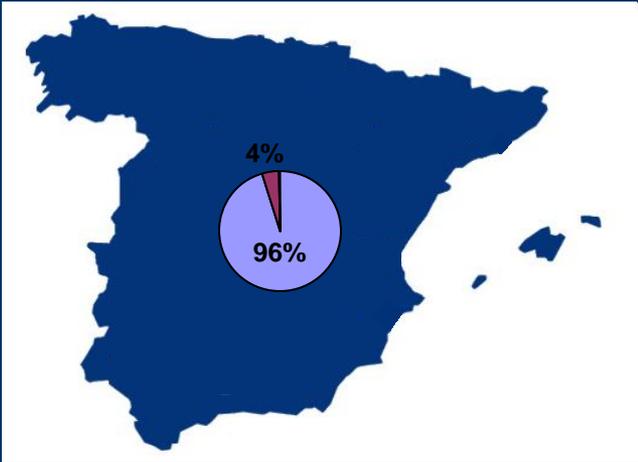
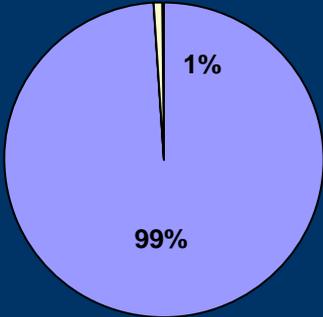
Main findings

Water footprint of Spain (46 Km³) (2004)



Internal WF (inside Spain)
13 Km³ (28%)

External WF (in other countries)
33 Km³ (72%)

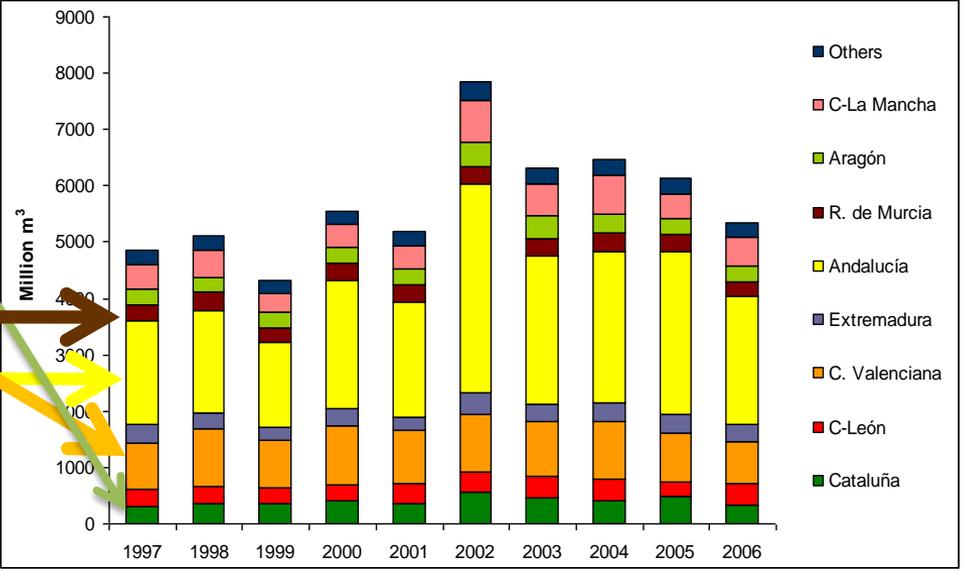
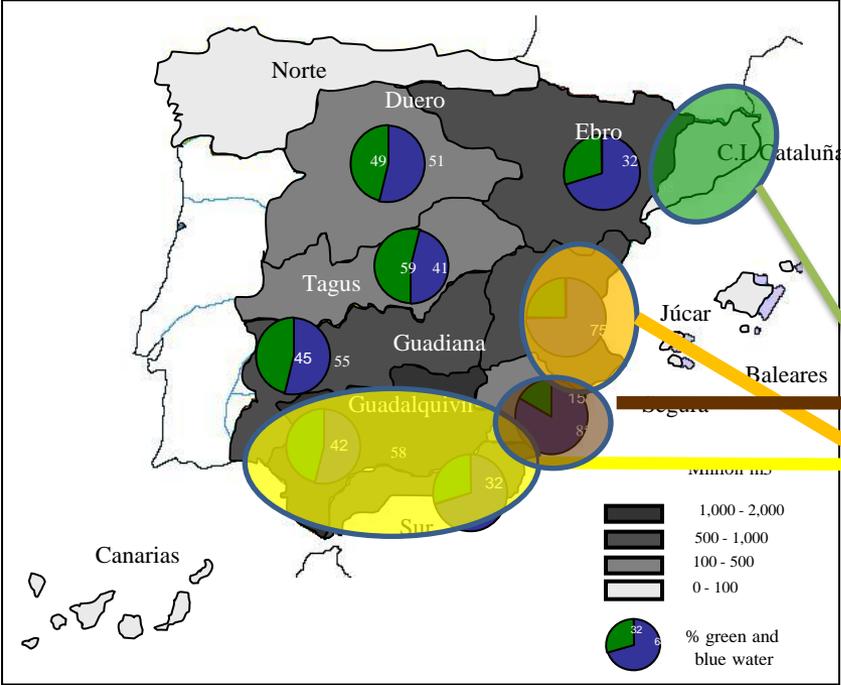
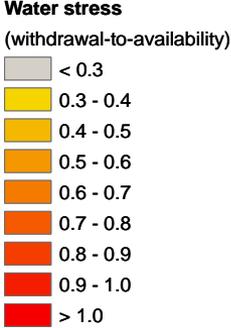


- Agricultural
- Urban
- Industrial

Source: based on Garrido et al. (2010)

Main findings

Blue Water exports

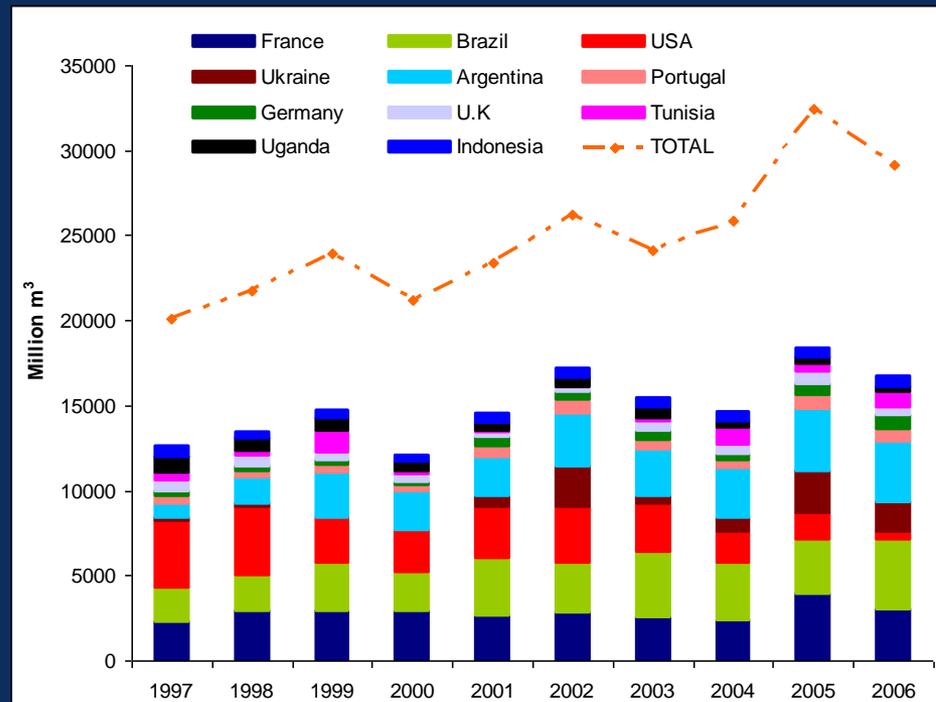


(Source: Garrido et al. 2009)

What kind of external footprint?

- Livestock economic relevance has increased during the last decade;
- Most livestock is exported (mainly pork) while grown with imported fodder (virtual water);
- Increased water dependency.

Crop-related virtual water imports by country of origin



Source: Garrido et al. (2010)

Caveats

- We build on previous work on the water footprints evaluated for more general contexts, e.g. livestock sector
- Because of lack of reliable data, the study did not differentiate between surface from groundwater sources
- Limited attention was paid to water pollution. In semi-arid countries it can magnify existing problems of limited water resources
- Seasonal demand from tourism is likely to exert significant pressure, particularly in coastal areas.

There will be a revised
version in 2011



OBSERVATORIO DEL AGUA
WATER OBSERVATORY

